**Amendments to the Claims**:

The following listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Previously Amended) A bipolar semiconductor device comprising:

a drain electrode;

a drain region having a first conductive type semiconductor and disposed on the drain electrode;

a drift region having a second conductive type semiconductor different from the first conductive type semiconductor of the drain region and disposed on the drain region;

a channel region having the second conductive type semiconductor and disposed on the drift region;

a gate region surrounding at least a part of the channel region via an insulation film, the gate region having the first conductive type semiconductor;

a source region having the second conductive type semiconductor provided on the channel region, the source region is located substantially at a center of the channel region, and the source region is isolated from the insulation film; and

a source electrode connected to the source region,

wherein a depletion layer is formed over most of the entire channel region when a predetermined voltage is applied to the gate region.

2-3. (Canceled)

4. (Previously Amended) The semiconductor device according to claim 1, further comprising a semiconductor region having the first conductive type semiconductor and provided between the channel region and the source electrode.

5-11. (Canceled)

12. (Currently Amended) A semiconductor device comprising:

a substrate having a first conductive type;

a drift region having the first conductive type and disposed on the substrate;

fig9.10A, 10B

a channel region having a second conductive type different from the first conductive type and provided on the drift region;

a gate region provided with opposing vertical sidewalls which ~~so as to~~ surround at least the channel region via an insulation film; and

a source region having the first conductive type and provided on the channel region, the source region ~~is~~ being located substantially at a center of the channel region, and the source region ~~is~~ being isolated from the insulation film~~;~~;

a source electrode connected to the source region, wherein an impurity concentration of the channel region is [equal to] or less than an impurity concentration in the drift region, and [a depletion] layer forms over the entire channel region sandwiched between the gate region when a zero bias is applied to the gate region.

112 1st

112 1st

13-19. (Canceled)

20. (Previously Added) A bipolar semiconductor device comprising:

a drain electrode;

a drain region having a first conductive type and disposed on the drain electrode;

a drift region having a second conductive type different from the first conductive type and disposed on the drain region;

a channel region having the second conductive type and disposed on the drift region;

a gate region surrounding at least a part of the channel region via an insulation film, the gate region having the first conductive type;

a source region having the second conductive type provided on the channel region, the source region is located substantially at a center of the channel region, and the source region is isolated from the insulation film; and

a source electrode connected to the source region,

wherein at least a part of the source electrode forms a Schottky junction with the channel region.

21. (Previously Added) A bipolar semiconductor device comprising:

a drain electrode;

a drain region having a first conductive type and disposed on the drain electrode;

a drift region having a second conductive type different from the first conductive type and disposed on the drain region;

a channel region having the second conductive type and disposed on the drift region;

a gate region surrounding at least a part of the channel region via an insulation film, the gate region having the first conductive type;

a source region having the second conductive type provided on the channel region, the source region is located substantially at a center of the channel region, and the source region is isolated from the insulation film;

a source electrode connected to the source region; and

a semiconductor layer having the second conductive type located between the source region and the source electrode, the semiconductor layer including an end face extended to a position covering at least a portion of the gate region.

22. (Previously Amended) The semiconductor device according to claim 12, wherein:

112 1st

the gate region has the first conductive type.

23. (Previously Amended) The semiconductor device according to claim 22, further comprising a source electrode provided on the source region.

24. (Previously Added) The semiconductor device according to claim 12, wherein at least a part of the source electrode forms a Schottky junction with the channel region.

112 1st

25. (Previously Added) The semiconductor device according to claim 22, wherein at least a part of the source electrode forms a Schottky junction with the channel region.

112 1st

fig. 8

26. (Currently Amended) The semiconductor device according to claim ~~1~~12, further comprising a semiconductor layer having one of the first and second conductive ~~type~~ types located between the source region and the source electrode, the semiconductor layer including an end face extended to a position covering at least a portion of the gate region.

27. (Previously Added) The semiconductor device according to claim 26, wherein a thickness of the insulation film formed on an upper portion of the gate region is thicker than a thickness of the insulation film formed on a side portion of the gate region.

28. (Currently Amended) The semiconductor device according to claim 26, further comprising an insulation layer located between the semiconductor layer and the source electrode and having an opening portion for the semiconductor layer and the source electrode to contact, wherein a width of the opening portion is wider than a distance between the opposing vertical sidewalls of the gate region surrounding at least the channel region.

29. (Currently Amended) The semiconductor device according to claim 27, further comprising an insulation layer located between the semiconductor layer and the source electrode, and having an opening portion for the semiconductor layer and the source

electrode to contact, wherein a width of the opening portion is wider than a space between the opposing vertical sidewalls of the gate region surrounding at least the channel region.

30. (Currently Amended) A semiconductor device comprising:

a first cathode region having a first conductive type;

a second cathode region having the first conductive type and disposed on the first cathode region;

a first anode region having ~~a second~~the first conductive type and provided on the second cathode region;

a trench structure provided so as to surround at least the first anode region via an insulation film; and

a second anode region having the ~~second~~ [first] conductive type and provided on the first anode region, wherein an impurity concentration in the first anode region is equal to or less than an impurity concentration in the second cathode region.

31. (New) A semiconductor device comprising:

a first cathode region having a first conductive type;

a second cathode region having the first conductive type and disposed on the first cathode region;

a first anode region having a second conductive type and provided on the second cathode region;

a trench structure provided so as to surround at least the first anode region via an insulation film; and

a second anode region having the second conductive type and provided on the first anode region, where an impurity concentration in the first anode region is low to effect pinch off of the first anode region when a reverse bias is applied to the trench structure.

32. (New) A semiconductor device comprising:

a substrate having a first conductive type;

a drift region having a second conductive type and disposed on the substrate;

a channel region having the second conductive type;

a gate region provided so as to surround at least the channel region via an insulation film; and

a source region having the second conductive type and provided on the channel region;

a source electrode connected to the source region, wherein an impurity concentration of the channel region is equal to or [less than] (112 1st) an impurity concentration in the drift region, a depletion layer forms over the entire channel region sandwiched between the gate region when a zero bias is applied to the gate region, and at least a part of the source electrode forms a Schottky junction with the channel region.

33. (New) A semiconductor device comprising:

a substrate having a first conductive type;

a drift region having a second conductive type and disposed on the substrate;

a channel region having the second conductive type provided on the drift region;

a gate region having the second conductive type provided so as to surround at least the channel region via an insulation film; and

a source region having the second conductive type and provided on the channel region;

a source electrode connected to the source region, wherein an impurity concentration of the channel region is equal to or [less than] (112 1st) an impurity concentration in the drift region, a depletion layer forms over most of the entire channel region sandwiched between the gate

region when a predetermined voltage is applied to the gate region, and at least a part of the source electrode forms a Schottky junction with the channel region.

34. (New) A semiconductor device comprising:

a first cathode region having a first conductive type;

a second cathode region having the first conductive type and disposed on the first cathode region;

a channel region having the first conductive type and provided on the second cathode region;

a gate region provided so as to surround at least the channel region via an insulation film; and

an anode electrode connected to the channel region, wherein an impurity concentration of the channel region is equal to or less than an impurity concentration in the second cathode region, and a depletion layer forms over the entire channel region sandwiched between the gate region when a zero bias is applied to the gate region.

**Amendments to the Drawings**:

The attached sheet includes changes to Fig. 11B as approved by the March 2, 2001 Office Action. The attached sheet including Figures 10A-11B replaces the original sheet including Figures 10A-11B.

Attachment: Replacement Sheet